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# SOME LEGAL, JURISDICTIONAL, AND OPERATIONAL IMPLICATIONS OF A CONGRESSIONAL TECHNOLOGY ASSESSMENT COMPONENT

Louis H. Mayo
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PROGRAM OF POLICY STUDIES IN SCIENCE AND TECHNOLOGY

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# SOME LEGAL, JURISDICTIONAL, AND OPERATIONAL IMPLICATIONS OF A CONGRESSIONAL TECHNOLOGY ASSESSMENT COMPONENT

A Statement by

**Professor Louis H. Mayo**

before the
Subcommittee on Science, Research, and Development
Committee on Science and Astronautics
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## ABOUT THE AUTHOR

LOUIS H. MAYO is currently Vice President for Advanced Policy Studies and Director of the Program of Policy Studies in Science & Technology at The George Washington University. Professor Mayo has been a member of the Law School faculty since 1950. He was Dean of the Graduate School of Public Law from 1960 to 1966. He served as Executive Secretary of the Network Study Staff of the Federal Communications Commission during 1956-1957. Professor Mayo's publications have covered a variety of topics in the areas of communications and the impact of technology on public policy. He has recently published a series of papers on the technology assessment function in connection with work in the Program of Policy Studies in Science and Technology.

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## I - TECHNOLOGY ASSESSMENT: CONTEXT AND NEEDS

Substantial attention has been given to the needs of Congress for more adequate technology assessment support. Alternative notions about the specific functions and organizational arrangement to supply this support have also been given systematic consideration. The purpose of this paper is to examine briefly, through the means of a hypothetical assessment structure, certain operational implications of a Congressional Assessment Component.

Many of the controlling or influential conditions are readily apparent. Technology assessment is a vast and pervasive function engaged in by a multiplicity of participants in both the public and private sectors. Assessing entities differ as to objectives, resources, capabilities, practices, and outputs. Such entities are usually concerned with some special aspect of the overall Policy Analysis, Project Planning, Program Implementation, Regulation, or Monitoring-Evaluation process. Some assessment entities deal with numerous technologies; others deal with only one application of a given technology; perhaps most are concerned with a narrow, specialized dimension of a given application. Few entities in our assessment structure deal with the full spectrum of social impacts of a given technological application. Even when the outputs of all existing entities in some way associated with the assessment of a particular application are combined, we cannot assume that a total assessment of all the significant social impacts have been identified and evaluated. In short, our assessment function is highly fragmented.

A deficiency exists in our information management capability for assuring adequate total impact assessments or for providing the continuity of assessment data which will identify those social impacts which need to be given attention in specific assessments. Our present assessment organization and procedures do not assure that the outputs of the multiple assessment entities constituting the assessment system for any given technological application will interact in the normal course of events (or will be consciously integrated at given intervals) so as to effectively combine assessment outputs. Assuming that such integration does periodically occur, one must still ask whether the outcome constitutes a total impact assessment of the given application. It would seem to be fairly well agreed that the Congressional Committee Hearing-Forum has not always been an adequate mechanism for integrating the relevant information into an understandable, cohesive whole.

A further factor to be noted is that numerous assessments are made by entities other than Congress which, for all practical purposes, are final. Through statutory authorization various Boards and Administrations within the Executive Branch are the loci for such assessments as are those regulatory agencies which deal with technological problems. In many instances, as with the Food and Drug Administration and the Atomic Energy Commission, a highly institutionalized assessment system for relevant applications has been developed. Where such regularized assessment systems are performing adequately, there would seem to be little need for Congressional concern other than with periodic oversight to assure continued satisfactory performance. In many areas

of technological development serious deficiencies do exist, however, which would seem to require more intensive Congressional attention, at least to the extent of assuring the establishment of assessment procedures which will provide adequate assessments, total impact or otherwise, as needed.

The great variety of assessment demands and assessment tasks in conjunction with the diversity of assessment entities, make it difficult to grasp the scope of the assessment function which should be undertaken by a reinforced Legislative assessment component. Put quantitatively, what professional capability and supporting resources are required through what period of time to adequately perform a specified assessment task? Numerous variables are involved in our assessment practices:

- The character of the technology to be assessed
- The particular application to be assessed and the specific operational context in which such application is located
- The objective of the assessment: feasibility, costs, prospective social uses, possible social harms, need for further research, need for safety precautions in use, need for continuing regulation, etc.
- Limitations on resources for the assessment (time and professional talent)
- The social indicator/evaluation scheme or schemes to be employed in such evaluation

The possibility of finding precise equivalencies between the given assessment task and the time, facilities, and professional manpower required is not encouraging. Often resource constraints define the scope of the task whatever the ideal magnitude of support might be. Arbitrary constraints on time and professional support are imposed out of simple

necessity to define the scope of the task and to assure its execution. One need only mention the following recent assessments in order to gain some notion of the variety of arrangements (including subject matter, objectives, and organizational structures) involved in the assessment function:

A. Executive Branch:

1. Noise - Sound without Value. Federal Council for Science and Technology (Committee on Environmental Quality), September 1968.

2. Considerations Affecting Steam Power Plant Site Selection. Office of Science and Technology (Energy Policy Staff), 1968.

3. Environmental Impact of the Big Cypress Swamp Jetport. U.S. Department of Interior, September, 1969.

4. Potential Mechanization in the Flue-Cured Tobacco Industry with Emphasis on Human Resource Adjustment. Department of Agriculture (Economic Research Service), September, 1969.

5. The Automobile and Air Pollution: A Program for Progress. Department of Commerce (Commerce Technical Advisory Board, Panel on Electrically Powered Vehicles), October, 1967.

6. Tomorrow's Transportation: New Systems for the Urban Future. Department of Housing and Urban Development (Office of Metropolitan Development, Urban Transportation Administration), 1968.

B. Legislative Branch:

7. The Search for a Low-Emission Vehicle. U.S. Senate, Committee on Commerce (Staff Report), 91st Congress, 1st Session, 1969.

8. Administration of Project Mohole by the National Science Foundation. A Report to the Congress by the U.S. Comptroller-General, April 23, 1968.

C. National Academy of Sciences, National Academy of Engineering, National Research Council:

9. Useful Applications of Earth-Oriented Satellites. Summer Study on Space Applications, Division of Engineering, National Research Council, NAS-NAE, 1969.

10. Drug Efficacy Study. A Report to the Commissioner of Food and Drugs from the Division of Medical Sciences, National Research Council, NAS-NAE, 1969.

11. Environmental Problems in South Florida. A Preliminary Report of the Environmental Study Group to the Environmental Studies Board, NAS-NAE, September 16, 1969.

Our preliminary probes into the technology assessment process by the Program of Policy Studies at GWU strongly indicate that to this point we have hardly made an impression on such conceptual challenges as that of defining an Adequate Assessment or on the analytical task of relating the adequate assessment of a given application to the level of resources required. This is said with full recognition that the studies initiated by the House Committee on Science and Astronautics (the Technology Assessment Reports by the National Academy of Sciences and the National Academy of Engineering and the Report on Technical Information For Congress by the Legislative Reference Service)[1] have

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[1] Technology: Processes of Assessment and Choice, Report of the National Academy of Sciences to the Committee on Science and Astronautics, U.S. House of Representatives, July 1969. A Study of Technology Assessment, Report of the Committee on Public Engineering Policy, National Academy of Engineering, to the Committee on Science and Astronautics, U.S. House of Representatives, July 1969. Technical Information for Congress, Report of the Science Policy Research Division of the Legislative Reference Service, Library of Congress, to the Subcommittee on Science, Research and Development of the Committee on Science and Astronautics, U.S. House of Representatives, April 1969.

greatly advanced our thinking on these and other critical assessment questions.

My comments will be directed to the following topics: 1) The positing of a hypothetical Technology Assessment Component for legislative support; 2) The posing of a number of questions relating to the operational context of this assessment component, including the Organizational/Operational Framework, General Operational Problems, Access to Relevant Information, and the Utilization of Assessment Data and Analyses; and 3) Some selected comments relevant to the questions posed.

While the content of these remarks is cautionary with respect to potential operational difficulties of a legislative assessment support component, it should be understood that such comments do not reflect a negative attitude toward the need for an improved technology assessment structure. To the contrary, the purpose is to advance some questions which are likely to arise with the operations of a new assessment component, however general may be the support for its proposed functions. That substantial reasons lend support to the need for a better structured technology assessment function seems clear. That some observers question whether such an arrangement will make an appreciable improvement in the performance of this function is, however, a point not to be lightly dismissed. Further, existing entities may be concerned over a loss of status or of function as a result of the implementation of any new effort to more adequately assess the social benefits and costs of advancing technology.

## II - CONGRESSIONAL TECHNOLOGY ASSESSMENT COMPONENT: A HYPOTHETICAL STRUCTURE

The intensification of professional attention to the technology assessment function over the past few years would seem to be based on three primary assumptions: 1) That advancing science and technology should be applied in a better informed and more deliberate manner so as to maximize social benefits and minimize social costs; and 2) That the technology assessment function can be more adequately performed than is now the case with a resulting net gain in the social benefit/cost ratio of technological applications; and 3) That the Congress needs an independent technology assessment capability of its own. Hence, we need to know which technology assessment systems are performing adequately and why, and which technology assessment systems are not working well and why. Several deficiencies are apparent to those who have given attention to this problem, as for example, the lack of coordination among relevant assessment mechanisms for particular applications and the inability, for this and other reasons, to perform total impact assessments of such applications. With an understanding of the more serious deficiencies, it is feasible to move to the question of what can be done to improve the adequacy of the assessment function. This basic question can be reduced further to inquiries relating to the conceptual, organizational, and operational aspects of a new mechanism or arrangement for achieving an improved assessment function.

It is evident that the range of organizational alternatives which might be employed in order to provide more effective technology assess-

ment data to the Congress is extremely broad. Certain suggestions have been made by the recent reports on Technology Assessment of the National Academy of Sciences and the National Academy of Engineering and by the Legislative Reference Service of the Library of Congress on Technical Information For Congress. It might also be noted that many other suggestions have been made by Committees of the Congress as well as by individuals. Eilene Galloway discusses the topic of Scientific Advice for Congress in "An Analysis of Three Proposals" which is included in the book Knowledge and Power, edited by Sanford A. Lakoff (1966). All such proposals have certain recognizable disadvantages as well as advantages. All leave considerable areas of uncertainty as to how useful such mechanisms would prove to be in actual operation. No doubt, any additional alternatives will have similar characteristics. The task, however, is to examine as thoroughly as possible beforehand the means of maximizing the adequacy of the assessment function while minimizing insofar as practicable, the legal, jurisdictional, and other operational difficulties.

In recognition of the reluctance to establish new agencies out of fear of simply adding further bureaucratic impedance to the governmental assessment circuit some observers no doubt feel that the sensible approach is to locate any additional assessment capability in an existing organization. Yet, the NAS/NAE Reports on Technology Assessment suggest that new mechanisms are needed. The NAE Report states in its Summary of Findings:

> Technology assessments on a broad range of subjects are feasible and can be expected to be useful to the decision-making processes of the Congress, when prepared by properly constituted, independent, ad hoc task forces with adequate staff support and time. (p.3).
>
> A management organization, controlled by and answering to the Congress, should arrange for the preparation of technology assessments for Congressional purposes. No single, permanent organization can be envisioned that could provide adequate in-house expertise to execute assessments in all of the fields that may be required by Congress. Therefore it would be useful to contract for or to administer and organize the assessment task forces. (p.4).

The NAS Report gives attention to several organizational alternatives. It was agreed among this panel that there should be important assessment components in both the Legislative and Executive Branches. With reference to the Congress, one alternative considered was that of a Joint Congressional Committee on Technology Assessment supported by a highly qualified staff. Another separate alternative was that of a Technology Assessment Office serving the Congress as a whole. The NAS Report states that: "The panel is not prepared to recommend a choice between a Congress-wide unit and a joint committee." (p.106).

In view of the fact that possibilities for a new assessment arrangement are almost unlimited and that subsequent operational characteristics would depend to a substantial extent upon the particular arrangement selected, it is felt useful to posit a hypothetical Congressional Technology Assessment Component for purposes of this discussion. The arrangement here posited is not necessarily offered as the most desirable among the various alternatives. It has been selected for two primary reasons: 1) The basic structure is easily grasped; and 2) The interrelationships which would be involved in the operations of such a

component raise a rather broad range of questions which probably merit consideration preparatory to the design of a new mechanism.

In the barest, skeletal form the Assessment Component posited consist of two elements:

1. An Office of Technology Assessment which will perform a variety of assessment tasks in support of Congressional decision making.

2. A Joint Select Committee on Technology and Society which will focus attention on the general problem of the application of technological resources to social needs as well as perform consulting, advising, and oversight functions in connection with the operations of the Office of Technology Assessment.

A more detailed exposition of the concept, functions, and organizational aspects of the Congressional Assessment Component are as follows:

Assumption:

That the Congress is in need of improved informational and analytical support on legislative matters involving substantial scientific or technological components.

An assessment arrangement with the below noted characteristics is posited for analytical purposes, i.e., the legal/political implications which may arise from the operations of a Technology Assessment Component.

Concept and Functions:

A Congressional entity which can perform the function of assembling and analyzing data relevant to an overall evaluation of the effectiveness of the process of applying technological resources to National social goals.

An assessment service which can assure the Congress and its Committees that the full range of social impacts have (or have not) been identified and the magnitude, intensity and persistency of such effects measured re significant technological applications; and provide (if requested and appropriate)

evaluations of the social desirability or undesirability of such impacts in accord with an explicit scheme or schemes of social indicators.

An assessment service which performs primarily an "integrationist" function, making maximum use of the assessment data from various existing technology assessment systems so as to provide Total Impact Assessment data to the Congress with the greatest effectiveness and economy.

An assessment service which can evaluate for the Congress the adequacy of assessment systems for existing or prospective applications, identifying deficiencies in existing "regularized" or "institutionalized" assessment systems and recommending means for correcting such deficiencies. (For example, the lack of reliable data on certain obvious social impacts or the failure to provide a forum for all affected segments of the public to advance claims or complaints re technological applications).

An assessment service which can provide the Congress with initial assessments on new or prospective applications if no regularized assessment system exists for such task and such assessment is not forthcoming from other reliable sources.

An assessment service which can advise relevant Committees of the Congress (when requested) information on segments of the public which should be represented by witnesses in the ultimate assessment forum (Congressional hearing).

An assessment service which can provide for an information service by which assessment information can be accumulated in an orderly, current, and usable fashion.

Organization: (Prescribe by Statute)

1. Set out declaration of Congressional Policy (Concept and Functions as noted above).

2. Establish an Office of Technology Assessment (OTA) to carry out the desired functions.

3. Provide for a Director of the Office to be appointed by the President for an extended term (10-15 years).

4. Provide for the Director to obtain from all Departments and Agencies of the Federal Government pertinent assessment information on technological applications (primarily non-defense) which the OTA may from time to time require in the performance of its responsibilities (with exceptions minimized and noted).

5. Provide contractual authority for the OTA with respect to Project Research Support.

6. Provide for joint consultation with the National Science Foundation on Institutional Grant Support to Universities, National Laboratories, Policy Analysis Groups and similar Organizations which can provide continuing developmental support in specialized areas of technology assessment.

7. Provide for a Joint Select Committee on Technology and Society which will perform the following functions:

   a. Keep fully and currently informed on the status and prospects for the application of technological resources to national social goals.

   b. Provide a forum for the evaluation of the overall impact of technological applications on the full spectrum of social needs.

   c. Encourage the use of analytical approaches and information management techniques in the assessment of technological applications which will support an overall system of social accounting.

   d. Consult and advise with the Director of the Office of Technology Assessment on the policies, objectives, tasks, and assessment practices of the Office.

   e. Review periodically the performance of the Office of Technology Assessment.

   f. Recommend to the Committees on Government Operations the annual budgetary support for the Office of Technology Assessment, including joint programs with other offices or agencies.

   g. Maintain the closest practicable liasion with the Executive Office of the President and agencies of the Executive Branch responsible for the application of technological resources to social needs.

One point merits attention before proceeding to more specific questions. While this assessment arrangement is not posited as a model to be advocated to the exclusion of others but rather as an analytical reference, there is one conceptual thrust to this arrangement which justifies brief elaboration and strong emphasis. The rationale underlying the Joint Select Committee on Technology and Society is not that it serve merely as a link between the Congress and the Office of Technology Assessment, undertaking Congressional coordinating functions re public issues involving significant technological components processing requests from various Committees directed to the OTA, performing as a consulting and oversight Committee for the OTA, and providing a mechanism for facilitating the OTA's information exchanges with other governmental agencies and private sector entities. The JSC would have a broader responsibility than technology assessment in the sense of identifying the impacts of given applications and evaluating the social benefit/cost ratio of such applications. This type of analytical task would be the province of OTA. The Joint Select Committee would assume the responsibility of keeping fully and currently informed on the total national potential for the application of technological resources to social needs. Technology assessment is only one aspect, however important, to this more general function. The outcome of a total impact assessment of a prospective technological application under specified conditions is, of course, essential in determining whether and how such technology is to be applied. However, this analytical task is, or should be with new technologies, only one significant phase

in the process of getting the technology applied if it does have real potential for eliminating certain social harms or for contributing to various social objectives. Put another way; the mere positing of a technology against relevant social needs is only a beginning of the process of moving such technology into an operational program. The process of technology application is a social/political action process, not just an analytical task which involves the recognition of the interaction of such elements as:

- Participants in the relevant socio/political context in which the application is to be applied
- The Perspective and Resources of such Participants
- Influential Contextual Conditions and Trends
- Situations of Assessment (Forums) and/or Decision (Arenas)
- Alternative Strategies employed by Participants
- Alternative Outcomes of Assessment Forums or Decisional Arenas
- Probable Social Impacts of such Outcomes

It is not suggested that the JSC have any direct legislative authority with respect to the actual process of getting socially useful, available, and prospective technologies applied. It is suggested that it perform an informational integrating function and provide a forum whereby an approximate accounting can be continuously conducted on the effectiveness with which our technological resources are being applied to social goals (for example, how our national laboratories, scientific institutes and associations, the universities, R&D firms, and so forth, can best contribute their facilities and skills to social objectives).

A compelling reason for this suggestion is that a positive thrust should be given to scientific and technological enterprise which represents one of our great national resources. The assumption of a responsibility to review and appraise the effectiveness with which we are applying such resources to pressing national social needs would fill a neglected policy function. Further, it would serve as a counterbalance to any tendency to become negatively oriented in the technology assessment function, i.e., to emphasize detriments to the neglect of the social benefits flowing from particular applications.

## III - OFFICE OF TECHNOLOGY ASSESSMENT : RESPONSIBILITIES, POWERS, AND OPERATIONS

The following questions are focused upon the operations of the hypothetical Office of Technology Assessment although the relationships necessarily involve the posited Joint Select Committee on Technology and Society, other Committees of the Congress, the Legislative Reference Service, the General Accounting Office, the Executive Office of the President, various Departments and Agencies in the Executive Branch, the Regulatory Agencies, and private sector entities.

### A. Organizational/Operational Framework

1. Assuming the Technology Assessment Component posited, should the statutory scheme provide explicitly that the final authority for setting the assessment tasks of the OTA are to be with the Director of the OTA? Should such authority be qualified by requiring consultation with the JSC on Technology and Society at stated intervals, i.e., annually, semi-annually? Since the JSC would be representative of the entire Congress, how might the process of agenda formulation be organized?

2. What critieria of priority should be employed in selecting assessment tasks?

3. Would the acceptance of the foregoing method (A.1.) of "setting the agenda" necessarily preclude response to assessment requests from other sources? Individual Congressmen? All Congressional Committees having jurisdiction over social problems areas or governmental activities involving significant scientific or technological components? The President (BOB, OST, etc.)? Executive Agencies, Programs, or Administrations?

4. Should the OTA be directed by statute to maintain a continuing information interaction with the OST/BOB in order to coordinate assessment efforts and maximize the productiveness of assessment activities in both the Executive and Legislative Branches? If so, how might this be accomplished?

5. Will the OTA be expected to coordinate only with OST/BOB or to maintain continuing assessment information arrangements with all executive and regulatory agencies as well as private sector entities as a means of assuring the optimum use of assessment capabilities?

6. Should provision be made for "public hearings" by the OTA? Under what circumstances might such hearings be required? For what purposes should the OTA otherwise initiate hearings? Under what conditions might hearings be intitated "on petition" and by what "interested parties"? If formal hearing authority should be provided, under what circumstances would witnesses be placed under oath? If a witness is compelled to testify, would he have the right to counsel? Should counsel be privleged to cross-examine witnesses giving evidence contrary to his client? Would testimony or communications from witnesses or correspondents with the OTA be privileged? As an alternative to OTA hearings, might the public hearing function be conducted only by the Joint Select Committee on Technology and Society?

7. In order to maintain the "independence" and "integrity" of the assessment function, what proscriptions, if any, should the Congress place on the Director and Staff of the OTA with respect to associations and relationships with other assessment entities or interested participants?

8. Will reports of the OTA have any special legal standing in civil or criminal cases against government officials or private companies responsible for the application of technologies which have resulted in alleged harm to a complainant? Will the director or members of the OTA be subject to subpoena as witnesses in such cases?

B. General Operational Problems

1. To what extent might a skeptical attitude toward the social utility of a Congressional Assessment Component hinder the operations of OTA?

2. To what extent might the critical/cautious attitude arising from jurisdictional conflicts or additional administrative inconvenience hinder the operations of OTA?

3. What "image" should the OTA attempt to cultivate? While the basic thrust may be toward the establishment of a non-partisan, non-political entity of recognized capability and competence, in what respects must the OTA inevitably assume a "partisan" stance? Will it be an "active" or

"passive" ombudsman? What type of role should it play and what "reputation" should it seek in order to maximize its usefulness in the legislative process?

4. What would be the likely implications should the OTA assess not merely technological applications per se (assuming competent and responsible administration and management) but the quality of the management of the application as well?

5. What general guidelines should be provided, and by whom, for the division of responsibility for technology assessment among OTA, the Science Policy Research Division of the Legislative Reference Service of the Library of Congress, the General Accounting Office, and particular Committees of the Congress, if any, which may wish to provide or continue with their separate assessment functions?

6. How might the OTA provide for the accommodation of ad hoc, special, "non-programmed" assessment activities? Even should the Director of OTA attempt to minimize the ad hoc obligations of the Office, how could he respond in a practical sense re:

   - Permitting OTA staff to appear as witnesses before Congressional Committees on specific bills?
   - Providing special reports on specific bills?
   - Making temporary assignments of OTA Staff Members to Committees?
   - Making temporary assignments of OTA Staff Members to Executive Agencies?

7. What type or types of Assessment Data Systems should be initated and maintained by the OTA? Will the OTA, in general, tend to apply its resources to the task of closing deficiencies in existing institutionalized assessment data systems and in designing and intitating new data systems for prospective technological applications?

C. Access to Relevant Information

1. What will be the scope of the responsibility of the OTA for technology assessment? Will it have defined areas for inquiry or will it be given the broadest type of charter for inquiring into every facet of technological applications (existing and prospective) on a Total Impact Assessment basis - that is,

looking at all the social interactions of a given application? This is a basic question having implications for subsequent questions.

2. Will the OTA be provided with formal authority (similar to the GAO) which is essentially co-extensive with its responsibilities or might the compulsory authority of the OTA be deliberately minimized in order to encourage the development of mutually beneficial information exchange relationships? In other words, will the strategy be to persuade, appealing to the net gains from the technology assessment function, rather than to compel?

3. What should be the nature of the authority granted the OTA by Congress so as to facilitate its access to relevant information in the Executive Branch? In the Regulatory Agencies?

4. What would be the nature of the formal authority conferred on the OTA by the Congress so as to facilitate its access to essential data in the private sector: competitive information, private/personal information such as hospital or nursing home records, etc.?

5. What would be the position of the OTA if, subsequent to the establishment of the OTA, one or more of the Committees of the Congress now having oversight responsibilities for a given technological area refused to cooperate and directed the relevant Regulatory Agency and the regulated industry entities not to cooperate (re providing relevant assessment data) with the OTA?

6. What if the Secretary of an Executive Department should take a similar position and the President, while refusing to permit the exercise of Executive Privilege in the situation, remained indifferent?

7. Assuming that in some limited circumstances the OTA should have the subpoena power or should have access to information through the direct subpoena power of Congress, what guidelines should be provided which would define such limited and justifiable circumstances so as to withstand legal challenge?

8. Should the OTA have to resort to BOB "clearance" of its information surveys with private sector entities? Should the OTA have to resort to information filed with other government agencies rather than make direct demands on private industry?

9. What will be the procedures and criteria employed for "contracting out" special assessment studies or other tasks? To what extent might it be required to do such contracting out on a competitive basis? Will contracting out (especially if the OTA should undertake to utilize a large number and variety of contractors) tend to aggravate the information assess problems with the Executive Agencies and private sector entities (imposing upon such Agencies and entities an increasingly greater burden in terms of informational requirements)? What might be done with respect to selecting topics and contractors to minimize this burden?

10. What should be the procedure and criteria for selecting organizations or institutions which might qualify for continuing "institutional grants" to carry on segments of an overall "systems approach" to technology assessment?

11. What role will "experts" or advisory committees have in OTA operations?

12. How can the OTA handle various types of "conflict of interest" problems which might not arise as a legal issue but for reasons that full and candid information from a uniquely qualified individual would place him in a different position re his relationship with his associated organization or institution? Would the OTA activity bring up any new "conflict of interest" questions? What would likely be the attitude of the OTA re well informed people who are acting as regular consultants to various mission-oriented Government agencies?

13. Would any unique problems arise re the collection and retention of certain types of information under "for official use only" categories? Would problems be different from those which arise with the Census or with the Regulatory Agencies which do maintain the confidentiality of financial statements of the industrial groups regulated?

D. Utilization of Assessment Data and Analyses

1. If the OTA is to be primarily an assessment support activity for the Congress, will it nevertheless be assumed to be generally accountable to the Public? If some segment or participant in the "public" is dissatisfied with OTA performance, to whom can the complaint be made?

2. Which Committees will regularly receive the reports and statements of the OTA? Which Committees will receive particular reports and on what basis? Which entities of the Executive Branch? What private sector entities?

3. What will be the responsibilities of the OTA to inform relevant Committees of the Congress with respect to the Optimum Social System (effects and interactions) which should be examined when specific bills come before such Committees? This matter has special relevance to proposals involving continuing technological developments for which many of the relevant impacts have already been given attention in previous assessments?

4. Are there any types of assessment reports which will not be generally available to the Congress, the Executive Agencies, or to any segment of the public? Will the OTA direct its activities only to "non-security" problems? Will some reports be limited in distribution if "classified" material has been used but the report itself is not classified?

5. Who will be able to complain to whom in what forum and under what circumstances if the OTA undertakes to disseminate assessment data that may be considered by the complainant to affect national security or to involve private competitive information (trade secrets, etc.)?

6. Who will be able to complain to whom in what forum and under what circumstances if the petitioner asserts that relevant information (not necessarily his own) has not been taken into account in an OTA report that has been or is planned for general dissemination or to a Committee of the Congress?

7. While an OTA would not take any direct action to follow up its assessments where a recommendation is made explicitly or implicitly which is harmful or is allegedly harmful to the present or future activities of a private entity, might the OTA nevertheless be compelled (pressured) in some instances to hold rebuttal hearings for such projects?

8. What might be the possibility of instances arising in which advance notice of an assessment report (having substantial detrimental implications for a private entity or entities) would motivate the initiation of a suit for injunction to bar the release of publication of such report? How could such a suit be instituted?

9. Various problems of governmental immunity are herein suggested. What might be the liability of the OTA Director or Members of the Staff for people who have relied upon the safety of an application explicitly found beneficial by the OTA but which turns out to have serious adverse effects? Is there any precedent for personal or governmental liability of an analysis/advisory group such as OTA which has brought harm upon a private person or corporate person through arbitrary or irresponsible action?

## IV - SELECTED COMMENTS: ASSESSMENT PERFORMANCE CRITERIA

It is evident that the foregoing questions do not slide into precise, discrete slots as might be indicated by the grouping used. In a sense they are all interrelated. It is therefore useless to ponder long over the proper sequence. Yet it is imperative to be concerned about certain fundamental considerations: Just what assessment functions are required to satisfy the legislative needs of the Congress? Assuming a basic organizational structure, how can such Component be employed to most effectively perform these functions? If one is inclined to feel that resistance to the performance of these functions will be serious and persistent then the Component should be armed with sufficient formal authority to assure access to relevant information. If, on the other hand, one is disposed to believe that the effectiveness of the operation depends almost entirely on the promise of mutual benefit for the various assessing entities then the strategy would be directed toward the cultivation of cooperative, non-abrasive relationships with coercive tactics reduced to a minimum. In short, the scope of assessment responsibility provided or assumed, the formal compulsory authority with which the OTA is provided, and the manner of implementing the assessment function are all closely intertwined with the "image" of OTA which will evolve.

The desire to be appreciated, even admired, may not be wholly consistent with the tasks which must be performed. Is it wise, therefore, to assume that the success of the Congressional Assessment Component will depend largely upon the disposition of the OTA to

cultivate cooperative attitudes among relevant assessment entities? Might a "hard line" assumption be just as plausible? Or should the statutory scheme provide the broadest assessment responsibility with back up formal authority in the event certain intractable situations develop, in other words, provide the widest range of options in operational procedure? Rather than wallow in the "image" question and the general operational policy to be pursued, it is probably more profitable to think of essentials and examine how certain of the questions posed might relate to characteristics such as:

- Capability of the OTA to perform assessments as comprehensive and in as much depth as Congress may desire with respect to a given technological application per se or in the context of a given social problem.

- Ability of the OTA to select assessment tasks and arrange, with the assistance of the JSC, for the allocation of assessment tasks among the LRS, GAO, Executive Agencies, and private sector entities so as to most expeditiously and economically perform the desired Congressional assessment support role.

- Provision for access to the essential information sources for the assessments desired.

- Provision for full representation of affected participants in the assessment process

- Capability of the OTA to manage the intricate informational networks which are indispensable for the assembly of that data upon which adequate assessments for Congressional purposes can be made.

- Provision for sufficient detachment of the OTA from the political decision making process to assure independence of analysis.

- Provision for the linkage from OTA to the political process which will provide effective analytical support to decisional arenas.

- Provision for continuity of the assessment function
- Provision for continuing encouragement of the "professionalization" of the assessment function

It would seem advisable to restrict consideration of the questions posed in III above to a brief comment on the interrelationship of such questions to the following Assessment Performance Criteria:

- Defining and Limiting the Assessment Tasks of the OTA
- Notion of "Independence" of the Assessment Function
- Representation of Affected Participants in the Assessment Process

Discussion of the first criterion relates to such questions as:

A2, A3, A4, A5.

B4, B5, B7.

C1, C3, C8.

Discussion of the second criterion relates to such questions as:

A1, A3, A6.

B3, B6.

C1, C2.

Discussion of the third criterion relates to such questions as:

A3.

C4, C7.

## A. Defining and Limiting the Assessment Tasks of the OTA

What are the critical assessment needs of the Congress? An exhaustive answer would take some time. Clearly, Congress needs to be in a better position to assess the technologically oriented proposals

of the Executive Department. Congress needs continuous updating on prospective technological applications and their full social impacts. This Subcommittee itself has expressed such needs in part, but emphatically, in its Report on "Managing the Environment" wherein it was stated:

> Regardless of improvements in Executive Branch Organizations, the Congress needs an independent and comprehensive source of information and advice... (p.36)
>
> Congress (has) a unique responsibility in obtaining objective and complete information on technological consequences... (p.2)
>
> The intent of Congress...is to avoid arbitrary regulation and to establish a fact-based, rational decision-making process which integrates all the needs of society... (p.6)
>
> The best means of gaining long-term rational management is to generate an informational base and provide a policy to all operational programs which will cause individual decision makers to act in harmony with the entire system... (p.29)

and finally:

> The Congress should proceed to develop an independent capability for assessing the impact of technology on the environment. (p.8) [2]

It is apparent that the Congress needs Special Purpose Assessments of various technological applications related to environmental management and similar support for other social problem areas as well; it also need Total Impact Assessments which examine the full social

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[2] Report of the Subcommittee on Science, Research and Development to the House Committee on Science and Astronautics of June 17, 1968.

consequences of given technological applications. These two assessment approaches are interrelated. But whatever technologies are selected for total impact assessments and whatever social problem areas are selected for the investigation of technological applications as the cause or cure of such problems, there are other types of assessement activities which must be given attention. The JSC and the OTA would need a firm grasp on the existing technology assessment structure, the major social problem areas, technological resources which are available for the advancement of social goals, technologies which are contributing to social problems, technologies which are available for abating or controlling social problems, and ways in which the assessment function can most adequately be performed. If the OTA wished to be comprehensive and systematic about this preliminary appraisal, it might proceed with some approximation to the following:

1. Systematic grouping of major technologies.

2. Systematic organization of social goals, needs or problem areas.

3. Matching technologies to relevant or potentially relevant social needs so as to facilitate the identification of existing and prospective technological applications.

4. Examination of the existing Technology Assessment Structure in order to determine:

   a. Which of the existing (or potential) technological applications has a regularized (and adequate) technology assessment system?

   b. Which of the existing (or potential) technological applications do not have an adequate technology assessment system?

(Not capable of producing a total impact assessment or an optimum social sub-system for assessment with respect to a particular problem or issue)

c. Which technological applications have a potentially adequate technology assessment system with the need being only to make adjustments in assessing entities or in the assessment process to bring them up to an adequate level of performance?

d. Which technological applications represent both the level of effort and the characteristics of uniqueness which requires special treatment/assessment either by the new OTA structure or by special ad hoc assessment groups, boards, or commissions?

From this analysis the JSC/OTA will be in position to determine more accurately the level of effort required, the type of support needed, and the more promising internal and external organizational arrangements which should be developed.

This initial appraisal would provide an assessment information base which would show all of the assessing entities constituting the assessment system for major technological applications and for major social problem areas with appropriate cross-referencing. Since we cannot foresee all the possibilities under which social conditions will interact with particular technological applications, it would seem all the more essential to develop this comprehensive assessment information system so as to provide maximum sensitivity for detecting both opportunities for the application of technological resources to social needs and early warning signals of impending detrimental impacts.

Having taken this approach, we are immediately beset with a further critical question: How can the JSC/OTA Component be utilized so as best

to achieve Congressional aims with the most economical and proficient use of resources? One point upon which all tend to agree is that a new assessment component should reinforce and refine the assessment function rather than attempt to duplicate existing activities. But how can this notion be reduced to organizational and operational terms? While the OTA might be given the broadest assessment responsibility and commensurate formal authority to assure the execution of assessment functions, it should restrict its tasks to those which need to be performed but which are not now being performed. It should also develop procedures for assuring that all existing technology assessment systems are operating in an adequate manner.

A few illustrations should suffice to demonstrate how the assessment burdens of OTA can be limited to the essentials. Certain points have already been suggested. With respect to existing applications where a regularized assessment system now exists with the capability of performing adequately, the OTA would have no more than a monitoring and information integration function to assure that suitable assessment data is provided the Congress. The OTA should constantly strive to develop coordination within those highly fragmented assessment systems which provide no focal point for the integration of the total span of social impacts so as to regularize the system for performing adequate assessments. In short, the OTA should encourage, by whatever means are available, performance of assessment tasks by other entities actually or potentially capable of doing so. The OTA should take a strong anticipatory orientation toward technology and obtain, through study contracts or grants, comprehensive assessments of such technologies,

especially in cases where developing partisan interests may subsequently preclude access to relevant data or deliberately distort the issues involved. The OTA should also develop a scheme of priorities of assessment tasks which will assist in assuring that the more significant or critical matters are given attention. Both the NAS and NAE Reports on Technology Assessment attempt to provide some guidance in this connection. It is also evident from the previous discussion that assessment tasks should be located primarily in those entities best equipped to perform them. The development of such operational policies by the OTA should make its assessment responsibility more manageable.

Certain implications follow the foregoing approach. Consider, for example, that the Legislative Reference Service performs a particularly useful job for the Congress. More specifically, the Science Policy Research Division produced an excellent study on Technical Information for Congress. The list of technology assessment projects now in progress, as outlined by Mr. Jayson in these hearings on November 24, 1969, is certainly impressive.[3] It is also to be noted that the research staff assists the Committees of Congress in identifying witnesses, preparing reports, and serving as consultants to the Committees. As was indicated by Mr. Jayson, however, the management and monitoring of a technology assessment function as he envisages the emerging need "will require a substantial commitment of funds" in order to support a vastly enlarged assessment capability. In sum it would seem that an

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[3] Testimony of Lester S. Jayson, Director, Legislative Reference Service, Library of Congress, before the Subcommittee on Science, Research and Development, Committee on Science and Astronautics, U.S. House of Representatives, November 24, 1969.

Office of Technology Assessment would be required with new responsibilities whether attached to the Legislative Reference Service or not. In any event, the type of service now provided by the Science Policy Research Division is essential. Since this capability already exists there would be no need for an OTA to duplicate it. Further, as noted subsequently, the established practice of the Legislative Reference Service (SPRD) in responding to the requests of any Committee of the Congress may not be a procedure the OTA might deem advisable to follow. Yet, the "on call" procedure certainly appears to be a most useful one and will undoubtedly be continued by the Legislative Reference Service.

Implicit in the Report on Technical Information for Congress is the cautionary theme that technology assessment not be viewed as a simplistic process. There are endless ramifications. One which should be of concern is the necessity for and extent to which management considerations of technological projects will or should be emcompassed in the concept of assessment. The management of a technological application can make a vast difference in the resulting social benefits and costs of a project. An article in the Washington Evening Star of November 25, 1969, p.12, col. 1, illustrates this point. In connection with an investigation by the National Transportation Safety Board on "the carriage of large quantities of hazardous materials through populated areas (where) supposedly effective safety controls do not work," the Board is quoted:

> Many of the failures of safety controls are attributable to ineffective planning, design, and management of safety controls involving government and private industry.

Management considerations also suggest the activities of the General Accounting Office. While not normally thought of as a technology assessment entity, the GAO performs occasional studies which are clearly germane to technology assessment even though primarily directed to fiscal and administrative aspects of technological projects. For example, the GAO made a Report to the Congress on the "Administration of Project Mohole by the National Science Foundation" (April 23, 1968). The Annual Report 1968 of the Comptroller General (of the U.S.) states:

> Among the underlying factors which led the Congress to discontinue funding Project Mohole (a project to penetrate the mantle of the earth) was the steady escalation of the estimated cost and time to complete the project. These estimates increased from $46.7 million to $127.1 million and from 5 to 8½ years. The report contains an analysis of the reasons for these increases and points out that under the approach followed, the Foundation was not in a position to determine adequately that the project objectives were worth the money and resources that were necessary to attain them. Yet it was totally committed to the project.
>
> We suggested an alternative approach to be used by the Foundation in future major research and development projects involving totally new or exploratory concepts, calling for the projects to be conducted in a number of sequential phases. Each phase would represent a specific limited agency commitment whereby it would determine the feasibility of the project objectives, the means to attain these objectives, and whether the objectives would be worth the costs involved before a contractual commitment was made.

A recent report of the GAO was directed to an "Examination into Effectiveness of the Construction Grant Program for Abating, Controlling, and Preventing Water Pollution" (Federal Water Pollution Control Administration, Department of Interior) (November 3, 1969). This

Report states: (p.3)

Recommendations or Suggestions

GAO is recommending that the Secretary of the Interior require that the States, in establishing priorities for the construction of waste treatment facilities, and FWPCA, in approving grants for such construction, give consideration to (1) the benefits to be derived from the construction of the facilities and (2) the actions taken, or planned to be taken, by other polluters of the waterways.

FWPCA should consider utilizing systems analysis techniques in the planning for and implementation of water pollution control programs. FWPCA should consider also the practicability of providing, through its storage and retrieval of data (STORET) system (see p. 96), data needed by the States in:

-- determining their water pollution control requirements,

-- identifying alternatives available to solve water pollution problems,

-- formulating water pollution control plans, and

-- establishing implementation schedules and priorities for the construction of waste treatment facilities.

Another report of the GAO relating to the operations of an Agriculture Research Service of the Department of Agriculture illustrates how GAO functions involve not only the mechanisms and processes of assessment but also the potential for conflict-of-interest situations to arise in the use of private consultants.[4]

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[4] Washington Post, November 17, 1969, p. A2, col. 1.

While most GAO investigations relating to technology assessment pertain to completed or existing programs, some are anticipatory in character such as the special study made of some of the legal, competitive, consumer service, and other probable implications of the sale of AEC gaseous diffusion plants to private owners. A further example is the classified evaluation made to the Joint Committee on Atomic Energy of the Nike X/Sentinel anti-ballistic missile system in terms of economy, efficiency, and effectiveness.

The GAO has not developed a special capability for technology assessment nor is its professional staff broadly representative of professional skills in comparison, for example, with the Legislative Reference Service. However, the GAO's long experience in the appraisal/evaluative function, its movement toward enlarging its skill base so as to take into account a broader spectrum of social costs and benefits, and its increasing emphasis on the systems approach to major public projects are definitely compatible with a more comprehensive technology assessment function. Even the existing fiscal and management analysis capability of GAO would provide indispensable support to an OTA in taking a comprehensive view of given applications.

Yet, however substantial the services now performed by the LRS and the GAO in technology assessment, neither is organized presently to perform the types of functions that a Congressional Component such as that posited herein could perform. Neither is really a technology assessment manager in a comprehensive sense. The bolstering up of either of these organizations would, in effect, require that a new

organizational entity be established. The question then becomes whether there is promise of greater net benefit from the grafting of the expanded technology assessment function onto one of the existing organizations or by establishing a separate entity. The latter approach may add somewhat to the complexity of the organizational structure, but it would provide visibility for the assessment function which would not likely emerge if such function is subsumed in the existing LRS or GAO. Further, a new organizational entity would provide the conditions for the unique tasks with which OTA would be charged. For example, it would not be expected to serve a "mass of masters" as does the Legislative Reference Service. To put the matter differently, if the Science Policy Research Division were given the amplified assessment job, would it be able to meet its "on call" obligations while at the same time performing the information management tasks which will be required of the OTA? No doubt the GAO could develop a comprehensive assessment capability, but would not this effort inevitably be subordinated to traditional GAO fiscal and management functions? What the Congress would seem to need and the JSC/OTA would provide is both the management apparatus and the "feel" of being in control of the situation. This latter element of establishing confidence in our understanding and control of the movement of technological development is perhaps the most significant objective of all. In brief, the Congressional Technology Assessment Component posited herein should fully utilize the assessment capabilities of the LRS and the GAO and, in so doing, provide for an effective allocation of assessment tasks.

A further massive allocation of assessment responsibility (which will facilitate the performance of the JSC/OTA component) can be made to the Executive Branch Departments, Administrations, and Programs which are deeply involved with technological applications. One of the primary tasks of the OTA will be to assure comprehensive total impact assessments of given applications, as well as special purpose assessments for particular social problems. The most logical loci for total impact assessments are those agencies having primary authority over relevant technological applications such as DOT in transportation technology. Here is where the basic data relating to technological applications are, or should be, assembled, analyzed, and reported. Apparently, DOT does not yet have this data management system, but surely it is the locus for total impact assessments of transportation projects, not the OTA. The recent Report on "Transportation Information" to the Committee on Appropriations, U.S. House of Representatives by the Secretary of Transportation of May 1969 states:

> Good decisions depend on careful analysis of pertinent information, yet decisions involving billions of dollars in transportation expenditures are frequently based on inadequate information. Without adequate information, the chances of costly errors in these decisions are greatly increased. (p.vii)
>
> Present transportation information is characterized by significant gaps, fragmentation and incompatibilities. It is not possible to examine the transportation system as a whole or in terms of its related parts. The information problem is so great that considerable efforts will be required to bring about needed improvements in transportation information. (p.vii)

> The magnitude of expenditures involved in many decisions on transportation items is so great that even relatively small savings - resulting from the information program - will be large in absolute terms. These savings will pay for the cost of the information program many times over. (p.xi)
>
> Measures of the performance of the transportation system (in aspects besides safety) do not exist. There has been recognition recently of the need for national social indicators to parallel the long-established economic indicators. Indicators of the performance of the transportation system are a most important element in a general set of social indicators (p.127)

The foregoing relates only to one major technological application area. It demonstrates the truly staggering proportions of the information management task. It is not only undesirable that the OTA assume this entire task but would appear wholly infeasible for it to do so. Assessments made by the Executive agencies might to some extent be discounted by the ingrained skepticism of the Congress. But it would be the task of the OTA to evaluate such assessments. The implementation of the operation of the JSC/OTA component may require the reorganization of the information/assessment structure of the Executive agencies to a far greater extent than is herein posited for the Congressional Assessment Component. It would seem that these two assessment developments must proceed concurrently and in coordination. Being highly interdependent, the Congressional and Executive Components must closely mesh if the overall assessment function is to be effective. There must be a high degree of concurrence on what data is sought, means of identifying such data if existing, and means of specifying data which needs to be generated.

A real difficulty exists, however, in connection with making total impact assessments of many, perhaps most, technological applications. The formal authority for operations of those government agencies which are the most likely candidates for a total impact assessment responsibility re a particular application or applications is not necessarily co-extensive with either the full scope of effects of the application nor with the totality of aspects of the social problem context. As has been pointed out, fragmentation of the assessment function is basically a reflection of assessment entities with different authority, objectives, and capabilities. Hence, each might reasonably ask why it should accept responsibility for a total impact assessment. The Highway/Motor Freight Carrier application and the Aircraft Noise Problem are excellent examples of this division of formal authority and assessment responsibility. This is not only evident as in the fragmentation of authority in the Federal government but also as between the Federal, State, and Local levels of authority. Since operational programs with specified and usually narrow authority constitute a substantial segment of the assessment entities in most technology assessment systems having to do with major applications, the crucial problem of the OTA will be to integrate the outputs of such entities into a Total Impact Assessment.

In view of the need for most of the assessment burden, particularly with respect to governmentally sponsored technology, to be performed by Executive Branch entities, will not the effective functioning of the Congressional Technology Assessment Component depend upon a viable focal counterpart in the Executive Branch? Highly pertinent to this

point is an article on "Presidential Staffing in the Sixties and Seventies," by William D. Carey,[5] who has long experience in Bureau of the Budget affairs. After noting that "The modern President must cope with shortened decision intervals and reaction times, and his responses to domestic and foreign challenges must be immediate and certain," Mr. Carey states flatly: "The Presidency is weak in policy analysis" and follows up this discussion by pointing to a "second flaw" in these terms:

> In an age noted for advanced theory and technology in organizing and applying information, the presidency has no information system whatsoever. (p. 452)

He further states:

> It is hard to see how the presidency can grip the policy dilemmas of the 70's with its present shaky staff structure. There are limits to what can be asked of the Bureau of the Budget, which is staffed at the level it reached 20 years ago. The Council of Economic Advisors limps along with barely a score of professionals, while the Office of Science and Technology with some 35 employees cannot even begin to reshape national science goals. These units, together with the immediate White House staff, constitute the troops. (p. 457)

The NAS Report strongly emphasizes the need for an Executive Assessment Component as a focal point of Executive Department Assessments and as the locus of a comprehensive information system. One might question whether Congress should rely solely upon this data source. The NAS Report does suggest that the Congress might wish to establish an assessment

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5 William D. Carey, "Presidential Staffing in the Sixties and Seventies," Public Administration Review, September/October 1969, p. 450.

data system of its own. It would seem that the JSC/OTA component would feel considerably more confident if it had control of its own overall data source, although such system should make use of OST assessment data instead of duplicating the data generation process. In any event, the OTA, even if agreeing with the impacts identified by the Executive Component re a given technological application, may have quite different notions as to the social significance of such impacts, if measured against social indicators reflecting a Congressional rather than an Executive perspective. A total impact assessment capability in the OST, for example, which would undertake to integrate the outputs of Executive agencies and departments and private sector entities into total impact assessments would surely lend tremendous assistance to the OTA. If such capability is not established on a regularized basis then there would seem to be no alternative for the OTA than to develop direct communications links with all relevant Executive Departments and Agencies.

B. Notion of "Independence" of the Assessment Function

Considerable attention has been given to an assumed relationship between the credibility of the assessment process and the establishment of appropriate conditions for detached, non-partisan performance of the assessment function. This relationship has several facets and has been expressed in different ways. In this presentation it would have specific reference to the posited Office of Technology Assessment. The Report of the National Academy of Engineering on Technology Assessment is

relevant to this matter:

> Technology assessments should be produced in an environment free from political influence or predetermined bias. It can be inferred from the pilot studies that the selection of a preferred course of action, among alternative strategies derived from the assessment, is not a suitable task for the technology assessment group. This function should remain the prerogative of the legislator after he has been provided with the bases for the application of his judgment. (p.3)
>
> Members of a technology assessment task force should be chosen for their expertise but not as representatives of affected parties or special interests. (p.4)
>
> Experience shows that the task force members possessing a wide range of personal interests have been able to focus on the public interest and to set aside the biases of the organizations with which they are associated. (p.4)

The NAS Report on Technology Assessment makes a number of observations and suggestions with respect to this matter:

> A central deficiency of existing mechanisms for assessment is that they fail to separate promotion or protection from evaluation, and thereby compromise both their integrity and their credibility. To overcome that deficiency, any new mechanism we propose must be carefully insulated from direct policy making powers and responsibilities. (p. 80)

The Report also states that granting a power to "censor all technological developments" could not be insulated from external political pressures and further:

> Entrusting such sweeping powers to a new assessment entity would rob it of any special claim to objectivity and would render its judgments at least as suspect as those of any other regulatory body. (p. 81)

More directly to the point, the Report states:

> Any new assessment entity we propose, therefore, should be empowered to study and to recommend but not to act. It must be able to evaluate but neither to sponsor nor to prevent. We confront, however, something of a paradox, for though we wish to assure the neutrality of the new mechanism, we wish also to assure that it be influential. The panel has no thought of urging the creation of another organization simply to add one more voice to the many that already cry out for change. Thus, while it must itself seek to be apolitical, any new assessment mechanism must be located close to the centers of power in the political process; given the vast powers of the contending interest that will surround it, any organization less centrally situated would have no realistic hope of materially influencing public policy. (p. 82)
>
> The most we can hope for in creating a new mechanism for technology assessment is to introduce a greater degree of objectivity into the process and to inject a body of criteria and assumptions that reflect a wider set of interests and values than do the specialized organizations currently engaged in fragmented assessment activities. (p. 83)

The thrust of the foregoing extracts from the NAS and NAE Reports seems clear enough, although some of us might wish to substitute other terms such as "non-partisan" for "neutral" and the concept of "adequacy of assessment" for "objectivity of assessment." Perhaps the critical issue in addressing the proposed OTA function would be the reference to the "paradox" confronted in attempting to design an apolitical mechanism which will exert an appreciable degree of influence on the political process. What we must do, it would seem, is to brush away the "logical impasse" and get on with the job of designing the most creditable assessment function feasible for the express purpose of introducing useful and reliable assessment data in the legislative process. This does not eliminate the inherent difficulty, but it does present a

socially desirable task rather than a verbal "hang-up."

The GAO statutory scheme and practices are instructive in this connection. The Comptroller General is an "agent of the Congress." Among other things, the GAO has the authority and the responsibility to "make such investigations of revenue, appropriations, or expenditures as ordered by either House of Congress or any Committee having jurisdiction over such matters."[6] The Comptroller General also has the responsibility to report to the Congress, and if requested, to the President, including "recommendations concerning the legislation he may deem necessary to facilitate the prompt and accurate rendition and settlement of accounts and concerning such other matters relating to the receipt, disbursement, and application of public funds as he may think advisable."[7] One might contend that such matters are more susceptible to consensual agreement, that is, less controversial, than the subject matter of technological assessments, i.e., the identification and evaluation of the full range of social values affected. But certain investigations and reports of the GAO are clearly politically sensitive. Nevertheless, it is my impression that the GAO generally enjoys a reputation as a highly competent, reliable, and non-partisan activity. The high respect status enjoyed by the GAO is perhaps largely attributable to an intelligent use of discretion by the Comptroller

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[6] 42 Stat. 25, U.S.C. S 53 (b) (1964).

[7] 42 Stat. 25, 31 U.S.C. S 53 (a) (1964).

General and his associates as to what types of investigations and reports the GAO capability can be applied usefully as distinguished from those which are so highly politicized as not to be amenable to analytical treatment. It is also my impression that the National Transportation Safety Board of the Executive Branch (DOT) is gradually building a similar reputation for its impartial, deliberate process of accident investigation.

Measured against the criteria offered by the NAS/NAE Reports and the experience of the General Accounting Office, how might one evaluate the prospects for the effective functioning of the Congressional Assessment Component posited herein?

Would not the establishment of both a Joint Select Committee on Technology and Society and an Office of Technology Assessment provide an organizational focus of attention commensurate with the significance of advancing technology to social problem areas? This would provide an instrument for taking a total systems view of the interaction of technology with relevant participants, institutions, and values.

The Office of Technology Assessment is envisioned as an assessment support group directly responsible to the Congress through the Joint Congressional Committee on Technology and Society. It would be an entity separately identifiable from the staff of the Joint Committee. Would not such an arrangement provide organizationally for independence of function and operations by the OTA while at the same time providing for a direct link to the legislative process through the Joint Select Committee? In view of the enormity of the task that will be required

if any substantial increment of assistance is to be provided the Congress on technology assessment, it would seem abundantly clear that an Office of Technology Assessment is needed in addition to the Joint Select Committee staff.

As noted, the NAS Report warns against the assumption of too extensive a power over technological development and attempts to clarify the conceptual conflict between the maintenance of a non-partisan stance and the exercise of influence on decision-making. But it would appear that at a certain point on the curve the two characteristics can be mutually supportable. Once an entity has gained a reputation for usefulness and credibility, meaning that it is "listened to," it is also likely to be strengthened in its "independence" since the preservation of conditions for a detached analysis is recognized as serving the needs of all concerned. Again, it would appear that the GAO has come close to approximating this status. But the achievement of this status is not simply a matter of organization. Other variables are evident. First, the recognition by the Congress of the significance of our technological resources and the disposition to assure their effective utilization is essential. The OTA will have to be given broad authority similar in scope to that of the GAO in order to establish the importance of the OTA function and to assure access to relevant assessment data. Provision must be made for a staff which will provide an assessment capability of the highest order. A strategy of implementation must be designed which will gain the support of relevant assessing entities, including opportunity for general public participation in

the assessment function. Ultimately, independence of operations, as well as influence on decisions, will be achieved through performance and through public confidence resulting from professionalization of the assessment function.

One mark of independence is the degree of control over the activities of an entity. Surely, the broader the range of controllers, in the sense that an official or organization is in position to request or demand the performance of certain tasks, the less control the entity has. If all Congressmen or even all Committees can call upon the OTA for assessment tasks, then the independence of the OTA will clearly become diluted. This does not mean that the OTA would operate entirely outside the perimeter of Congressional needs. Such needs can be expressed through the JSC, and periodic consultation can keep the OTA currently apprised of Congressional needs. Nor would occasional ad hoc requests of Congressional Committees through the JSC necessarily be excluded. But the point is that the Director of the OTA should have the final determination of what assessment activities the OTA can usefully undertake. Consultation with JSC, as well as the requests for assessment assistance which will inevitably be directed to the OTA, will surely keep the latter finely attuned to the types of assessment tasks which the Congress and other agencies consider of importance. The Director will surely wish to be responsive to the Congress, but he must be in position to make a determination on the basis of an informed judgment as to what the more urgent existing and prospective needs are, and he should have the statutory authority to do so. It would seem

that a workable accommodation can be made. GAO experience is to some degree relevant here. The Comptroller General is not obliged by statute to respond to every individual Congressional request but apparently undertakes to do so within the limits of GAO capability.

Two processes are always working in conjunction: the political, partisan, adversarial system on the one hand and the non-partisan, detached, professional, "respected source of information and analysis" approach on the other. The first is nurtured by partisan interests, by differences in attitudes toward priorities in social values, and by uncertainties as to facts, predictions, and social consequences. The second has its source of strength in the need for a trusted source of information and in the need for the positing and explication of public interest-oriented standards of judgment against which partisan claims and demands can be tested and judged. In the assessment component posited, the JSC provides the link to the political decision process while the OTA provides the second, informational-analytical need.

The critical problem is to develop an OTA that is useful and credible. The danger of the OTA's abusing its powers appears remote. When an entity becomes influential, it simply means that it has an appreciable effect on immediate or ultimate determinations of legal rights and duties or of the allocation of resources, i.e., benefits and costs. Hence, those who are or may be affected will demand having either an input to the assessment forum or the opportunity to challenge assessment outcomes which may be contrary to their interests. Such provisions must be made, of course. But in addition, it would seem a

reasonable assumption that the wide diversity of interests represented in the Congress would effectively curb any undue exercise of influence over political decisions by the OTA. Furthermore, whether obliged by statute or not, the OTA would surely follow the information access and dissemination policy as set forth in the Freedom of Information Act.[8] This practice would not only be desirable in order for the OTA to develop effective working relationships but for the purpose of establishing its credibility with relevant governmental and private sector entities. Such informational practices themselves are effective constraints on arbitrary or thoughtless action.

C. Representation of Affected Participants in the Assessment Process

The concept of total impact assessment of technological applications requires that the full spectrum of social interactions be explored by the OTA. The staff of the OTA, representing all relevant professional and disciplinary skills, will be in a position to identify most likely impacts of an application. However, this internal process of analysis may not in many instances provide a fully confident basis for assessment even though one purpose of the OTA in using assessment project contractors, institutional grantees, advisory groups or special ad hoc commissions will be to assist the OTA in identifying the social impacts of given

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8 Freedom of Information Act, 80 Stat. 383, amended 81 Stat. 54, 5 U.S.C. S 552 (Supp. IV, 1967).

applications or of alternative technological projects and making determinations on the magnitude, intensity, and persistency of such impacts. In addition to the identification of effects, however, there is the further dimension of assessment which will arise in connection with some assessment tasks, i.e., the evaluation of the social desirability or undesirability of such impacts. Certain segments of the public may well view such impacts as benefits or threats in quite different ways. Every application involves both benefits and costs, but it does not follow that those segments of the public which share the benefits necessarily coincide with those segments of the public which must bear the costs. It is often difficult to gain full appreciation of these considerations without direct input from such affected publics. Perhaps in a majority of situations those segments of the public affected will have an organizational channel for expressing their views which will come to the attention of the OTA. It is likely, however, and especially with prospective applications, that segements of the public will be affected which are not represented by an organized interest group or such group might not have perceived the implications of the application. Hence, the question arises as to how the OTA is to be assured of data on the full span of actual or probable social consequences.

Some sort of modified public hearing procedure which would invite relevant informational inputs during the assessment process need not be incompatible with the concept of a professional, impartial, public interest-oriented entity such as the OTA. A question does arise as

to the extent such procedure should be formalized. Many entities shy away from the judicialization of what are essentially assessment determinations, feeling that the rigid procedures characterizing the formal adjudicatory adversarial process deter rather than facilitate access to relevant data. The view is sometimes expressed that the adversary process is not suitable to the temperament of those whose professional modes of inquiry tend toward the dispassionate search for "truth" rather than to the extraction of the "facts" through partisan, sometimes compulsory questioning. One must face the reality of those assessment situations, however, where the assessment concerns existing applications as contrasted with prospective projects. In these situations, the assessment outcome will inevitably affect legal rights and duties or the allocation of power, political or economic. This situation invites controversy and demands to assert partisan claims.

It would not seem advisable for the OTA to be made subject to the Administrative Procedure Act[9] or that it pursue hearing procedures which would require the imposition of similar processes. The Congress is, of course, specifically excluded from the definition of "agency" provided in the APA. Further, the OTA would not have any "rule-making" or "adjudicatory" functions. In such hearings under the APA "A party is entitled to present his case or defense by oral or documentary evidence, to submit rebuttal evidence, and to conduct such cross-examination as

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[9] Administrative Procedure Act, 80 Stat. 381, 5 U.S.C. S 551 et seq. (Supp. IV, 1965-68).

may be required for a full and true disclosure of the facts."[10] Possibly relevant as a "policy" to follow in OTA assessment processes, however, is the provision in Section 556 (e)[11] that "When an agency decision rests on official notice of a material fact not appearing in the evidence in the record, a party is entitled, on timely request, to an opportunity to show to the contrary." Yet, even the APA provides in the same Section that "Any oral or documentary evidence may be received, but the agency as a matter of policy shall provide for the exclusion of irrelvant, immaterial, or unduly repetitious evidence.

Probably something is to be learned from the procedures and practices of the National Transportation Safety Board in connection with "public hearings." The Board is an unusual type of assessment entity, the Department of Transportation Act specifically stating that in the exercise of its functions the Board is charged with a continuing review of the safety situation with respect to all modes of transportation.[12] The Act further states that the Board in the exercise of its function powers, and duties shall be "...independent of the Secretary and other offices and officers of the Department." Section 1654 (b) of the Act prescribes that the Board shall have responsibility for determining cause or probable cause and reporting the facts, conditions, and

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10 80 Stat. 386, 5 U.S.C. S 556 (d) (Supp. IV, 1965-68).

11 80 Stat. 386, 5 U.S.C. S 556 (3) (Supp. IV, 1965-68).

12 Public Law 89-670, Sec. 5, 80 Stat. 935, 49 U.S.C. S 1654 (1966).

circumstances of accidents investigated under authority transferred to the Secretary of Transportation. Reports and recommendations of the Board, as well as special studies, must be made public. The Board is concerned with the fullest possible information. It is not concerned with authoritative determinations of placing fault or assessing legal liability. Its findings are not admissible in court. In order to obtain the most candid and uninhibited evidence feasible it is my understanding that adversarial procedures have been discouraged.

This operation raises an extremely interesting and critical question, however, relating to the status of an independent, non-partisan entity rendering assessment decisions which may ultimately have an influence on the allocation of benefits and costs in the political process or in the determination of rights and duties in the legal process. The NTSB is responsible for establishing the probable cause of accidents and this finding is directly related to fault and liability. In accident investigations the accident has occurred. Liability for certain parties and remedies for other potentially exist. The Board's recommendations have been generally accepted; thus its assessments substantially influence official decisions. Hence, various participants have a stake in its findings or may feel they do. This encourages a partisan approach which may inhibit full disclosure of facts. In such circumstances, it should be expected that partisan interests will demand to be heard.

But the Board has also employed so-called "public hearings" to evaluate means of solving problems. This is more or less equivalent to the assessment of a prospective technological application rather than an

existing one. On October 31, 1969, "The National Transportation Safety Board...announced that more than 18 aviation organizations and government agencies (would) testify during the Safety Board's public hearing beginning November 4th seeking to find ways and means to define and correct the national aviation problem of midair collisions."[13] Rather than following the somewhat formal proceedings of accident investigations, the Board set forth the rules to be followed, namely that the hearings would be a "seminar-type proceeding" and that "only Board Members will question witnessess." This procedure would seem to fit more closely Section 1654 (d) (2) of the Transportation Act providing for "special studies" than to Section 1654 (d) (4) of the Act pertaining to "accident investigations." Yet even the initiation of the latter is limited to those the Board "deems necessary and appropriate." But the point of interest is that by structuring a hearing in this manner the NTSB provided a means of assembling relevant data from affected participants without being burdened by the legal apparatus of a formal hearing. Subsequently, of course, should a recommendation of the NTSB be implemented by the FAA, then a rule-making proceeding would be initiated in accord with the APA. Does this suggest that the OTA should restrict its "public hearings" to a similar essentially informal procedure and avoid efforts to judicialize the information gathering function? This approach would accommodate a modified adversarial system enabling

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13 SB 69-88.

relevant partisan interests to register their views on the technological application involved. It would avoid most of the inquiries raised in Question A6 in Part III, although it would not eliminate the situation implicit in Question C7, i.e., data needed from a non-cooperative private sector entity. The experience of the National Commission on Product Safety[14] should be reviewed in this connection. The Commission was authorized to hold public hearings, to require private participants to submit reports and answer surveys, to administer oaths, and "to require by subpeona the attendance and testimony of witnesses and the production of all documentary evidence relating to the execution of its duties."[15] Several public hearings have been conducted by the Commission which apparently have been instrumental in securing official or voluntary action on behalf of consumer protection.[16]

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14 National Product Safety Commission Act, Public Law 90-146, 90th Congress, 1st Sess., 81 Stat. 467 (1967).

15 81 Stat. 468, S 3 (a).

16 National Commission on Product Safety, "Progress Report on Results of Commission Work," November 18, 1969.

## V - CONCLUDING COMMENT

The application of technological resources to national social needs is a matter which should be viewed in the broadest perspective. Technology assessment is a part of this general process. Technology in all its ramifications is definitely one of our major national resources. It surely provides means of advancing many of our social objectives speedily and effectively. We seem to be at a critical decision point concerning the allocation of national resources to social needs. This task should not be relegated solely to the partisan political process, however important we consider the political/adversarial system. Some of the most promising of our technological resources are new concepts and techniques of information management and systematic decision making. We are beginning to perceive some of the advantages in systems and cybernetics approaches. Techniques of automatic data processing, operations research, and simulation can be invaluable in bringing relevant knowledge to bear on intricate policy decisions. Converting the notion of technology assessment to an operational system provides an unparalleled opportunity to apply these technological skills. The need for synthesis of increasing specialization of knowledge and function, the complex nature of our public problems, the absolute necessity of bringing a problem-oriented approach to these matters if we are to gain an effective degree of control over them would seem to drive us inexorably to the use of these technological/analytical skills. I am not referring to the mechanization of the legislative process. I am speaking of bringing a higher degree of rationality to the legislative

process - a rationality that is tied to democratic values. Specifically, I do not see such techniques as means of isolating the public decision function from the public. Rather, the use of modern communications technology and systems analysis provide the means by which public participation can be assured to a degree never before possible. In sum, the initiation of a more systematic and comprehensive technology assessment function presents not only an opportunity to usefully apply new technological skills but in so doing should encourage a broadened spectrum of public participation.